SQL

Ray

SCHEDULE

- DB backups
- Views and tables
- challenges
- Self-read

DB BACKUPS

- WHY BACKUPS?
- WHAT KIND OF BACKUPS?

Why backups

- Prevent data lose
  - Risks: power outage, hackers, …
- Revert to desire state
  - Revert transactions

Types of backups

- Full backups
- Copy backups
- Incremental backups
- Differential backups

Differences among backups

- Database backup normally associates with couple elements:
  - Data tables (database itself)
  - Transaction logs

DIFFERENCES AMONG BACKUPS

Method	database	logs	Delete committed logs?	notes
Full backup	V	V	V	
Copy backup	V	V	X	A copy backup is used to create a full backup of the Exchange Server database without disrupting any backup procedures that use an incremental or differential backup
Incremental backup	X	V	V	Log files are not deleted if the backup fails.
Differential backup	X	V	X	

Ref: https://www.ibm.com/docs/en/tsmfm/7.1.1?topic=processing-types-database-backups

CHALLENGE

- GIVEN BELOW TABLE PLEASE USE SQL STATEMENT TO PRODUCE DESIRED OUTPUT

Subject	visit	Dosage given	Dosage return
0001	Cycle 1 Day 1	75	0
0001	Cycle 02 Day 3	125	25
0001	Cycle 5 Day 8	Null	100
0003	C01D8	35	10
0003	Cycle 1 Day 15	45	35
0005	Cycle 02 Day 1	75	75
0005	C02D8	85	10
0008	Cycle 2 Day 01	75	10
0001	C10D8	125	15
0003	Cycle 2 Day 8	85	Null
0003	Cycle 02 Day 01	45	10

CHALLENGES

subject	cycle	compliance
0001	Cycle 1	74.22%
0001	Cycle 2	95%
0005	Cycle 1	80%

- Output ALL cycle statistics if any of the subject has drug compliances in any cycle < 80%, see mock-output above
- Drug compliance is defined as total amount of drug taken / total amount of drug given within each cycle,
  - if dosage given is null, neglect the entry
  - If dosage return is null, fill with 0 instead
- Note cycle 1 and cycle 01 should be treated as the same cycle
- CnDx indicates Cycle N Day X, N <= 99, X <= 30

VIEWS AND TABLES

- The main difference between view and table is that **view is a virtual table based on the result set of an SQL statement, while the table is a database object which consists of rows and columns that store data of a database.** In brief, a programmer cannot create views without using tables

Self-read: Database index

- https://en.wikipedia.org/wiki/Database_index
- https://docs.microsoft.com/en-us/sql/relational-databases/indexes/clustered-and-nonclustered-indexes-described?view=sql-server-ver15
  - Focus on clustered/ non-clustered indices, what are the differences